REMARKS/ARGUMENTS

Information Disclosure Statements

The Examiner continues to object to the number of documents cited in the lOSs filed in this application since apparently there are too many to be fully considered "in the time allotted for examination." There is no such thing as an excessive number of prior art references. And the USPTO has been enjoined from trying to apply the new rules to which the Examiner makes reference. It is respectfully suggested that the Examiner apply the present rules to the Examination of this application which impose no limit on the number of references which might be material to the examination of an application.

As previously noted, the Court which decides most patent cases, namely the Court of Appeals for the Federal Circuit (CAFe), has issued instructions which instruct applicants not to filter prior art before submitting it to the Examiner.

The Examiner is again reminded that applicants may have to provide a non-trivial number of references in accordance with the duty of disclosure that is ultimately defined not by the Office's standard of materiality as set forth in 37 C.ER. § 1.56(b) but by the standard set by the CAFC: "information is material where there is a substantial likelihood that a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent." Cargill, Inc. v. Canba Foods, Ltd., 476 E3d 1359, 1364, 81 U.S.P.Q. 2d 1705 (Fed. Cir. 2007) (quoting 37 C.ER. 31.56(a) (1991)). The CAFC has recently reminded applicants of its "policy that 'applicants [should] continue to submit information for consideration by the Office in applications rather than making and relying on their own determinations of materiality.'" Id. at 1367 (quoting

Critikon, Inc. v. Becton Dickinson Vascular Access, Inc., 120 F.3d 1253, 1257, 43 U.S.P.Q. 2d 1666 (Fed. Cir. 1997), cert. denied, 523 U.S. 1071 (1998)).

The policy of the CAFC is that applicants are not to rely on their own determinations as to what art is more material and what art is less material. Applicants should therefore err on the side of disclosure or face that possibility of a charge of inequitable conduct in later litigation. So if applicants are not supposed to rely on such determinations, how can applicants possibly induce patent examiners to rely on such determinations by flagging one document as allegedly being more relevant than another?

And there are many good reasons for the policy enunciated by the CAFC. The undersigned has certainly seen Examiners cite art against claims which the undersigned has found not to be very relevant. Indeed, in this very application the Examiner will be advised why the Applicant disagrees with the relevance that the Examiner ascribes to the cited art. But assuming the Examiner in this application is a 'reasonable examiner' as envisioned by the CAFC, and since the Examiner cited Mizrahi, for example, then it is the sort of document that should be cited in an IDS even though the applicant does not believe it to be particularly relevant (for reasons which will be discussed below). Also, the undersigned has seen Examiners cite art which the undersigned would have believed not to be relevant, based on his own understanding of an invention, only to have the Examiner point out why the claims were too broad because the Examiner construed the claims in a manner quite unanticipated by the undersigned. So exactly how is an applicant or a patent attorney supposed to discern, in advance, exactly which documents are relevant in the mind of a reasonable examiner? There is no "reasonable Examiner" litmus paper or crystal ball available to applicants and their patent attorneys! Since applicants cannot successfully discern, in advance, exactly which documents are relevant in the

mind of a reasonable examiner, a policy has been promulgated by the CAFC that applicants should not even try to do that.

Anyway, since the CAFC has already given guidance on this issue, and since neither the applicant nor the Examiner is in a position to overrule the CAFC, the USPTO, if it wants to see some other test for the submission of prior art, should have Congress overrule the CAFC by passing appropriate legislation. But until that occurs, perhaps we should just abide by the policy established by the CAFC. If the Examiner needs more time to consider the prior art then the Examiner is encouraged to get his supervisors to allow him to spend the time needed. The USPTO should not think of itself as being a widget factory where each widget is allotted some fixed amount of time to be produced.

Second, how is anyone supposed to determine reliably what art is the "most relevant" to the invention? The "invention" in, this case, is presented by 37 different claims! Note how the Examiner applied the prior art in the Official Action. Is any one of the several cited references the very most relevant reference to the "invention"? And if no single reference is the "most relevant" how is anyone supposed to figure out which references cited by the applicant might fall into the magic "top twenty" category? It would make more sense to post this information on the Internet and ask for a popular vote. At least then applicants would not live in fear of being accused of misleading the USPTO by selecting the documents they might think are the most interesting.

The Examiner's reliance on the MPEP is misplaced. It was not adopted in the manner required by the Administrative Procedures Act and therefore it has no legal standing. It merely expresses the opinion of the USPTO.

The Prior Art Rejections based on Mizrahi

Optical amplifiers are not the same thing as optical modulators

The Examiner asserts that the patent by Mizrahi anticipates the elements of claims 1, 6 and 11. However, the Examiner mistakenly assumes element 50 shown in Figures 2 and 5 of Mizrahi is an optical modulator. Element 50 is **NOT** an optical modulator, rather it is an optical amplifier. And an optical amplifier is **NOT** an optical modulator! Indeed, an optical modulator is shown in Mizrahi as item 26 of Figure 3 in Mizrahi.

Mizrahi knows the difference between an optical amplifier and an optical modulator. Indeed just look at the different ways they are described. It should evident from the text (Column 5, lines 23-24 and 39-64; Column 6, lines 6-19) that describes a modulator in more detail that Mizrahi's modulators are not the same as the optical amplifier 50.

The Examiner makes an a factual assertion in the official action at page 9, item 10 whereat the examiner asserts that it is "common engineering design knowledge that ... modulator". That assertion is not only believed to be incorrect, it fails to comply with the rules of practice. All factual assertions by the Examiner must be placed in affidavit format. See 37 CFR 1.104. A proper request was made in the last response and is again re-iterated.

An optical modulator, such as the optical modulator recited in Claim 1 of the present patent application can be defined as "a device in which a signal-controlled element is used to modulate a beam of light," (see definition provided in the Wikipedia on-line encyclopedia). As defined in the IBM Redbook on Understanding Optical Communications (page 238), which is available as a free download from the internet,

> "the job of a modulator is to replicate variations in an electronic signal onto an optical one. The light intensity should vary with some characteristic of the

> electrical one (voltage or current). For most applications we need digital modulation so we need the light to be switched ON or OFF and we don't care about states in between. In some applications we do need analogue modulation (where states between ON and OFF matter) and some modulator can achieve this. Modulators consist of a material that changes its optical properties under the influence of an electric or magnetic field. In general three approaches are used: electrooptic and magnetooptic effects, electro-absorption effects and acoustic modulators."

With respect to the passage of Mizrahi cited by the examiner, namely column 10 lines 17 - 42 as allegedly supporting his contention, that passage does not mention modulating the optical signal in the amplifier. Mizrahi states that "interference filter 82 (which as shown in Figures 2 is located within element 50) reflects the channel (referring to service channel whose optical signal is the modulated light output from service channel modem 160, which is separate from element 50) towards the second (optical amplification) stage 54 of the optical amplifier 50, thereby multiplexing the service channel optical signal with the payload wavelength division multiplexed optical signal (which is supplied to element 50 from optical combiner 30 by optical waveguide 40)." The text in the parentheses has been added by the applicant for clarification purposes. Mizrahi further states that "service channel modem 160 includes a directly-modulated laser source at 1625 nm for creating a modulated optical signal."

Thus, it is clear from the above discussion by Mizrahi that the modulated light is produced by a directly modulated laser source (in modem 160) and not by an optical modulator. Also, element 50 functions not as an optical modulator but rather as an optical multiplexer that multiplexes the optical signal supplied from optical combiner 30 with the service channel optical signal supplied from modem 160. So the optical signal 163 from the service channel modem is multiplexed with the optical signal output from element 30 and amplified in the

first stage of the optical amplifier. Multiplexing a signal and modulating a signal are different things.

In rejecting claim 1 the Examiner points to transmitters 20 of Figure 2A and characterizes them as being a laser. The transmitters 20 are shown in greater detail in Figure 3. Please consider that figure. Interestingly, each transmitter 20 (note the number of the block) has a laser 22 inside it together with other stuff. The optical output of the laser 22 is applied the optical modulator 26. Please note how a modulator receives a modulation signal, in this case delivered via driver 27.

Okay, now please turn back to Figure 2A. The modulated outputs from transmitters 20 are applied to a multiplexer 30 and thence amplified in amplifier 50 where the signal 163 from the service channel modem gets multiplexed with the amplified output of the multiplexer 30.Again, multiplexing a signal is not the same thing as modulating a signal.

But the examiner insists that amplifier 50 is really a modulator. Let's consider that proposition. The real modulator 26 shown on Figure 3 has a modulation signal associated with it for imparting information on the optical signal as mentioned at column 5, lines 39-40. Where is the modulation signal for the so-called modulator in amplifier 50? Recall the definitions given above. Is the modulation signal provided by signal 161? No, that signal is multiplexed at a mirror (interconnection element) 80. How about the node control signals? No, they apparently are there to help stabilize the optical amplifier against gain changes which apparently can occur when optical amplifier heats up, so that the status quo is maintained. Maintaining the status quo is the antithesis of modulating a signal!

The examiner cites (see pages 9 and 10 of the Official Action) a passage from Mizrahi as allegedly supporting his content that "an optical amplifier can

inherently be used as an optical modulator". The passage does not support the examiner and at no place does it say or suggest that "an optical amplifier can inherently be used as an optical modulator". The examiner is just mistaken in his understanding of these matters. There is a mirror (interconnection element) 80 inside the amplifier 50 which is used to multiplex signals, but that is not the same thing a modulator.

Moreover, it is evident from the text (Column 5, lines 23-24 and 39-64; Column 6, lines 6-19), which describes the modulator in more detail, that Mizrahi's modulator 26 is not the same as Mizrahi's optical amplifier 50.

Mizrahi's optical amplifier 50 is simply not a modulator. If the Examiner wants the board of appeals to opine on this matter, the Applicant is prepared to file a notice of appeal. But before filing an appeal brief, the applicant will seek a pre-appeal brief conference during which compliance with the rules of practice will be required by the applicant. The Examiner's assertion that "it is common engineering design knowledge that an optical amplifier can inherently be used as an optical modulator" (see page 9 of the official action) is inadmissible.

The Feedback Loop

The Examiner also asserts that Mizrahi has a feedback loop that connects from tap 221 (of Figure 5) back to an input for the optical modulator. See the assertion towards the bottom of page 2 of the official action.

However, according to the text associated with that figure (Column 14, lines 46-52 and Column 6, line 64 to Column 7, line 17) the feedback signal is used to calibrate a laser transmitter, one of which is depicted in Figure 3. Figure 3 shows a feedback signal as being supplied to control its laser 22 and NOT to either its real modulator 26 or the amplifier 50 (the pseudo modulator asserted by the Examiner). Claim 1 recites, *inter alia*:

an electronic loop portion coupled to receive output from the at least one associated photodetector and to provide an input for the optical modulator

Based on the Examiner's interpretation of claim 1, the recited optical modulator is met by element 50. That proposition is believed by the Applicant is utterly wrong, as already noted, but even if one were to assume that element 50 is an optical modulator, where is there any "electronic loop portion" which provides "an input for the optical modulator" (i.e. element 50)? It doesn't exist!

The Examiner wrongly asserts that since the feedback signal is used to control the laser and since the laser feeds amplifier 50 that that the feedback signal then somehow provides provides "an input for the optical modulator" (i.e. element 50 in the examiner's analysis). But the claim language is different. There is no "electronic loop portion" which provides "an input for the optical modulator" (i.e. element 50 in the examiner's analysis if it is assumed, for a second, that such analysis is correct) as claimed!

Thus, Mizrahi does not have "an optical modulator arranged in a feedback loop" as required by claim 1.

Claim 6

Regarding claim 6, the Examiner states that the optical tap 221 is wavelength selective. However, those taps in Mizrahi are NOT wavelength selective. There is no indication of wavelength selectivity for those taps 21 and 221. Instead, any wavelength selectivity is provided by gratings 25 and by gratings 222-225, which are separate from taps 21 and 221.

Claim 11

Regarding claim 11, the Examiner states that some wavelength selective optical tap of Mizrahi directs the wavelength selected light into different ones of optical channels 161, 165 of the feedback loop. However, Figure 5 of Mizrahi shows the tap 221 as being inside of amplifier 50' (and not separate from it). Also, the channels 161 and 165 are coupled to mirror (interconnection element) 80 and interference filter 82 rather than to tap 221. Note that interference filter 82 (described in Column 10, lines 37-42) could function as a wavelength selective optical tap. Nevertheless, the feedback path connected to channels 161, 165 (via node control processor 142 or 140) is used to control the laser 22 and not an optical modulator.

Claim rejections under 35 USC 103

• Claims 2, 7 and 12

Regarding claims 2, 7 and 12, the Examiner cites a patent by Desurvire as describing a plurality of optical delay lines (delay 115, 116, 117, 118 of Figure 1 in Desurvire). However, those delay lines are **electrical** lines and are **not optical** lines. This is evident from the accompanying text in Column 4, lines 10-27. Instead, the optical paths are from splitter 105, through optical gates 111-114 and to photodiodes 119-122. The optical gates 111-114 may open and close at different times to thereby modulate or switch the optical signal, but that is very different from imposing different amounts of delay on an optical signal.

Mizrahi describes his feedback loop at column 14, lines 17-57. The feedback paths are wavelength selective and Mizrahi's microprocessor uses the wavelength reference information to calibrate the laser transmitter using the

feedback path described in connection with his Figure 3. So if the desire is to calibrate the laser transmitters, why put delay in the feedback path? The Examiner says that a skilled person would do that "to identify the channels that contains optical signals". See page 4 of the official action. But Mizrahi already identifies the channels using gratings 222-225!

Given the mischaracterizations of both Mizrahi and Desurvire provided by the examiner it seems rather pointless, with all due respect, to get into a more detailed discussion of whether or not it would have been obvious to combine one mischaracterized reference with another mischaracterized reference, but the examiner's purported rationale for combining these references simply does not hold water!

• Claims 3, 8 and 13

Regarding claims 3, 8 and 13, the Examiner points the feedback loop of Mizrahi that is used to control the amplifier module 50. However, according to the cited text in Column 10, lines 17-27, that feedback loop and the microprocessor in that loop is used "for monitor and control of various amplifier functions such as optical signal gain (in conjunction with optional optical taps positioned before the first stage of the amplifier and after the second stage of the amplifier), pump powers, pump wavelengths, etc." There is no mention in Mizrahi that the feedback loop has a loop gain greater than unity. The examiner states that "the motivation for doing so (i.e., providing loop gain that exceeds unity) would have been to have a stable feedback control system". However, it is well known that having a feedback-loop gain greater than unity can easily result in a condition of oscillation or instability. Such instability would be the opposite of what would be desired for a "loop that controls (highlighted for emphasis) the various amplifier functions".

The examiner refers to the "Applicant's admitted prior art". It is respectfully suggested that the examiner may wish to read the prior art references cited by the Applicant as the examiner will learn therefrom that having a gain of greater than unity in a feedback loop is used to cause oscillation.

The examiner's factual assertion that "providing loop gain that exceeds unity ... would have been to have a stable feedback control system" is not only incorrect, it is also improper as the examiner has failed to comply 37 CFR 1.104 in making it. All factual assertions must be in affidavit format and the applicant must be given the opportunity to respond with counter affidavits.

• Claims 14 and 16

Regarding claims 14 and 16, it is important to note that according to Claim 1, on which these claims are dependent, the feedback loop contains an optical modulator and further includes at least one optical channel. The optical amplifier of Claims 14 and 16 is in the optical channel of the feedback loop and not in the optical modulator. In contrast, the optical amplifier stages 52 and 54, which actually perform the optical amplification, are contained in optical amplifier module 50. Thus, Mizrahi does not have an optical amplifier in an optical channel with both the optical channel and the optical modulator being part of a feedback loop. Mizrahi's optical amplifiers 52 and 54 are inside the element 50 and are not in the feed back loop which begins at mirror 80.

• Claims 5, 10 and 17

Regarding claims 5, 10 and 17, the examiner states that electrical outputs of the electronic gates in 150 of Desurvire are fed to an array of semiconductor optical amplifier gates 127-130. It is true that optical gates 127-130 have

electronic inputs R1-R4. However, the examiner does not provide any justification for associating those optical gates of Desurvire with the optical modulator of these claims. The optical gates 127-130 of Desurvire are not a part of any feedback loop, whereas the optical modulator of these claims is part of a feedback loop. The Applicant agrees with the examiner's explanation that one can construct an electronic digital filter from a combination of electronic gates and electronic delay lines. However, that is not the use Desurvire makes of those electronic gates in logic unit 150. Instead, the function of logic unit 150 is to accomplish "validation of the availability of a wavelength channel", as stated by the examiner and as described in Table T of Desurvire. The function of logic unit 150 is not to perform any frequency-domain filtering. The rationale for combining the teachings of the cited art just does not follow.

• Claims 24 and 31

These claims are rejected based on Shimonaka and Scarr.

Shimonka teaches in cited Figure 7 a single local oscillator laser diode 30 and a single light modulator 66. Yet these claims recite "optical modulators for modulating optical local oscillator signals". Note the use of the plural form. Shimonka does not met the recited claim limitation.

The examiner associates the recited multi-wavelength photonic oscillator with the master oscillator of Scarr and suggests that Scarr's master oscillator replace Shimonka laser diode. First, Scarr's master oscillator produces a single frequency output, fo, as shown in Figure 2 and also as described at column 2, line 66 through column 3, line 8 of Scarr. So Scarr's master oscillator does not meet the limitations in these claims that the "multi-wavelength photonic oscillator producing an optical output comprising multiple optical carriers and multiple modulation sidebands, said multiple optical carriers and multiple

modulation sidebands being grouped into more than one wavelength region with the optical output at each wavelength region comprising at least an optical carrier and a modulation sideband."

It is Scarr's acousto-optic modulator RNM1 that produces the multiple optical outputs of differing frequencies (which result from the acousto-optic interaction between the optical input and the RF input). But the examiner associates RNM1 with the recited "wavelength division demultiplexer coupled to an optical output of the multi-wavelength photonic oscillator, said wavelength division demultiplexer separating the optical output of the multi-wavelength photonic oscillator into more than one of said wavelength regions ...".

So Scarr's acousto-optic modulator RNM1 simply does not meet that limitation.

The Examiner also asserts that in combining Shimonaka and Scarr, that a skilled person basically substitute Shimonaka's local oscillator laser diode 30 with Scarr's master oscillator and RNM1 combination. That would mean that the output of Scarr's master oscillator and RNM1 combination would be applied to a single light modulator (66 of Shimonaka) instead to the channel modulators CM1-CM5. Why do that? So that the Scarr system would only work with a single TV channel as opposed to multiple TV channels? With all due respect, that just does not make any sense. It would hardly make for "optical fibre cables" which "are economically exploited" (see column 1, lines 11-13 of Scarr) to place a single channel on a single cable!

There is even a more fundamental error in the examiner's analysis. Note that both Scarr and Shimonaka as modified by Scarr place the modulator(s) downstream of local oscillator 30 in Shimonaka and downstream of Scarr's master oscillator and RNM1 combination. But claims 24 and 31 recite that "said

multi-wavelength photonic oscillator producing an optical output comprising multiple optical carriers and multiple modulation sidebands, said multiple optical carriers and multiple modulation sidebands being grouped into more than one wavelength region with the optical output at each wavelength region comprising at least an optical carrier and a modulation sideband". Additionally the recited wavelength division demultiplexer separating separates "the optical output of the multi-wavelength photonic oscillator into more than one of said wavelength regions, with the optical output at each wavelength region comprising at least an optical carrier and a modulation sideband". The cited art cannot meet these limitations when the modulator(s) is (are) specifically downstream of the element which the examiner characterizes as being a wavelength division demultiplexer!

Claims 30 and 37

These claims are rejected based on Shimonaka, Scarr and Mizrahi. Shimonaka and Scarr cannot be logically combined for the reasons given immediately above and even some rationale for combining these references could be contemplated, the suggested combination does not meet the claim limitations of claims 24 and 31 for the reasons given above. Claims 30 and 37 are dependent claims based on claims 24 and 31, respectively. Since they include the limitations of claims 24 and 31 and since the rejections of those claims cannot stand, then this rejection also fails. Additionally the examiner's analysis of the alleged teachings Mazrahi just do not hold water for reasons already stated above in connection with the rejection of claim 1

Allowable Subject Matter

The Examiner is thanked for the indication of allowable (or allowed) subject matter in terms of claims 18-23, 25-28 and 32-35. However, for the reasons given, it is believed that all of the claims pending in this application are allowable over the cited art.

Claim amendments

Claims 24 and 31 have been amended to deal with an obvious antecedent issue where the term "an optical output" was used to refer to a signal in one part of these claims and to a physical connection for the signal in another part of these claims. The examiner apparently overlooked this issue, as did the applicant until this response was prepared. The amendment does not alter the scopes of these claims in any manner.

Withdrawal of the rejections and allowance of the claims are respectfully requested.

* * *

The Commissioner is authorized to charge any additional fees which may be required or credit overpayment to deposit account no. 12-0415. In particular, if this response is not timely filed, then the Commissioner is authorized to treat this response as including a petition to extend the time period pursuant to 37 CFR 1.136 (a) requesting an extension of time of the number of months necessary to make this response timely filed and the petition fee due in connection therewith may be charged to deposit account no. 12-0415.

I hereby certify that this paper (and any enclosure referred to in this paper) is being transmitted electronically to the United States Patent and Trademark Office on

December 28, 2007
(Date of Transmission)

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